IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Niranjan Damera-Venkata   Art Unit   : 2625
Serial No. : 10/698,899   Examiner : Kau, Steven Y
Filed   : October 31, 2003   Confirmation No.: 3010
Title   : EMBEDDING INFORMATION IN IMAGES

Commissioner for Patents
P.O. Box 1450
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REPLY BRIEF

I.   Preliminary Remarks

On March 5, 2009, the undersigned (Edouard Garcia) mistakenly filed in the present application a Reply Brief that was written in response to an Answer in another application. Appellant requests that the Reply Brief filed on March 5, 2009, be disregarded by the Board.

The present Reply Brief supersedes the Reply Brief that was mistakenly filed on March 5, 2009.

A Petition for Expungement under 37 CFR § 1.59(b) was filed on March 6, 2009, in order to have the Reply Brief that was filed on March 5, 2009, removed from the file history of the present application.

II.   Introduction

Claims 1-38, which are the subject of this appeal, are pending.

Claims 1-38 stand rejected.

The pending claims stand rejected as follows:

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 2 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

A.   Claims 1-11 and 21-28 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

B.   Claims 1-11, 18, 28, and 38 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

C.   Claims 1-7, 10, 11, and 29-34 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420) and Wang (U.S. 5,337,361).

D.   Claims 8 and 9 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420), Wang (U.S. 5,337,361), and Lapstun (U.S. 6,512,596).

E.   Claims 12-20 and 35-38 stand rejection under 35 U.S.C. § 103(a) over Wang (U.S. 6,252,971) in view of Curry (U.S. 5,710,636) and Wang (U.S. 5,337;361).

III.   The Examiner's response to the Appeal Brief and Appellant's rebuttal

A.   **Claims 1-11 and 21-28 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.**

The Examiner has rejected claims 1-11 and 21-28 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

1.   Independent claim 1

a.   The Examiner has not established a *prima facie* case that the written description requirement is not satisfied

In the Appeal Brief (page 6-7), Appellant explained that the rationale given by the Examiner in support of the rejection of claim 1 under 35 U.S.C. § 112, first paragraph, did not satisfy the Examiner' initial burden to present evidence or reasoning to explain why one skilled in the art would not recognize in the original disclosure a description of the invention defined by the claims (see MPEP § 2163.II.A.3(b)). In particular, the Examiner's assertion that certain elements of claim 1 "are not disclosed in the original specification" and that there is "no hardware or software or mathematical derivation support found in the original disclosure" for

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 3 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

those elements does not constitute an explanation of "why persons skilled in the art would not recognize in the original disclosure a description of the invention defined by the claims."

In response to this explanation, the examiner merely quoted ¶¶ 31, 33, and 43 and asserted under each quoted paragraph that "there is no functional structure elements, steps, or processes supporting the features of 'respective ones of the bits having the first value <u>are derived</u> from respective ones of the contone image blocks' and 'and ones of the bits having the second value <u>are derived</u> from respective ones of the graphical code word symbols' (emphasis are added by the examiner) as claimed in the invention of claims 1 and 21 in the original disclosure." However, the mere quoting of various paragraphs followed by an unsubstantiated assertion that the quoted paragraph does not support the elements of the claim in question does not constitute an explanation of "why persons skilled in the art would not recognize in the original disclosure a description of the invention defined by the claims."

First, the Examiner has the burden to explain why the original specification <u>as a whole</u> does not reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed. The Examiner did not satisfy this obligation because he only considered each of selected paragraphs of the specification in isolation.

Second, the mere fact that the words "are derived" are not explicitly recited in the specification does not constitute an explanation of "why persons skilled in the art would not recognize in the original disclosure a description of the invention defined by the claims." Indeed, it is well-settled that the specification need not contain a literal transcription of the claim language defining the invention in order to satisfy the written description requirement. Therefore, the Examiner's stated rationale that the word "are derived" is not explicitly recited in the specification does not establish a *prima facie* case that the application does not comply with the written description requirement under 35 U.S.C. § 112, first paragraph (see MPEP § 2163.II.A.3(b)).

For at least this reason, the rejection of independent claim 1 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 4 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

 b. <u>Moreover, the subject matter of claim 1 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed</u>

As explained on pages 7-8 of the Appeal Brief, the specification describes the allegedly unsupported subject matter of claim 1 as follows (emphasis added):

- FIG. 3 and ¶ 31 discloses that: "The code word sequence generator 360 utilizes the incoming data to produce graphical symbols which correspond to the code words. At logic stage 350, when a bit from halftone bitmap 310 corresponding to the spatial location of halftone image data $o(m)$ is $b(m)=1$, then a symbol corresponding to a code word is generated and the output is set to that symbol."

- FIG. 3 and ¶ 33 discloses that: "In one embodiment, logic stage 350 may also contain additional logic that causes the test of $b(m)$ to be skipped when the input block $x(m)$ meets certain requirements, such as meeting certain minimum or maximum intensity thresholds, whereby the modified input image block is passed through to the output of logic stage 350."

- FIG. 4 and ¶ 42 discloses that: "In code word extraction stage 430, each relative bit of binary bitmap 450 is tested to see if it is a data indicator bit (e.g. value of 1) or an image indicator bit (e.g. value of 0). If it is an image indicator bit, the related sub-matrix of the aligned and corrected input image 250 is ignored or used to reconstruct the image (431); if it is a data indicator bit, then the image sub-matrix is passed to probabilistic analysis stage 440. In one embodiment, code word extraction stage 430 may also contain additional logic that causes the test of $b(m)$ from bitmap 450 to be skipped when the input block meets certain requirements, such as meeting certain minimum or maximum intensity thresholds, whereby the modified input image block is simply ignored as it is known to not be a data block."

Thus, specification explicitly discloses that if the halftone bitmap bit has a value of 1 (i.e., $b(m)=1$), the bit is a data indicator bit and the corresponding block of the halftone image 390 is set to one of the code word symbols (see ¶ 31, ¶ 42, and FIG. 3); if the halftone bitmap bit has a value of 0 (i.e., $b(m)=0$), the bit is an image indicator bit and the corresponding block of the halftone image 390 is set to the value of the quantized halftone image blocks $o(m)$ (see ¶ 30, ¶ 42, and FIG. 3). The specification also explicitly discloses that if certain minimum or maximum intensity thresholds are met, then the corresponding block of the halftone image 390 is set to the value of the quantized halftone image blocks $o(m)$ (see ¶ 33 and ¶ 42, last sentence).

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 5 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

One skilled in the art at the time the application was filed would have understood from these explicit teachings that blocks of the output halftone image 390 are produced from ones of the contone image blocks x(m) and ones of the graphical code word symbols 360 in accordance with the values of respective ones of the bits of the bi-level bitmap 310 (see FIG. 3), wherein ones of the output halftone image blocks associated with respective ones of the bits 310 having a value of 0 (or that correspond to image blocks meeting certain intensity thresholds) are derived from respective ones of the contone image blocks (see ¶ 33, 42, and FIGS. 3-4) and ones of the output halftone image blocks associated with respective ones of the bits 310 having a value of 1 are derived from respective ones of the graphical code word symbols 360 (see ¶ 33, 42, and FIGS. 3-4).

The Examiner responded to this explanation with the following statement (see page 24, second ¶ of the Answer; emphasis added):

> In re, the examiner respectfully disagrees with the above statements. The arguments above do not support the claim limitation of "ones of the bits having the first value are derived from respective ones of the contone image blocks". One ordinary skill in the art knows that a halftone image is a binary image and its bit value can be either 1 or 0, e.g. (i.e., b(m)=1 or b(m)=0). However, the original disclosure does not support "wherein ones of the output halftone image blocks associated with respective ones of the bits having the first value are derived from respective ones of the contone image blocks and ones of the bits having the second value are derived from respective ones of the graphical code word symbols".

In this response, the Examiner has misconstrued the pertinent language of claim 1. In particular, the Examiner improperly has construed claim 1 as reciting "ones of the bits having the first value are derived from respective ones of the contone image blocks," which implies that the "bits" are derived from the contone image blocks. The Examiner's proposed construction of the claim language is unreasonable because it is inconsistent with the way in which anyone would read the claim. For example, in accordance with the Examiner's construction, the subject of the claim (i.e., "ones of the output halftone image blocks") is left dangling without any verb, effectively rendering the clause incomplete and without meaning. In addition, claim 1 expressly states that the "bits" are elements of a bi-level bitmap that is determined from a graylevel value

Applicant   : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed   : Oct. 31, 2003
Page   : 6 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

(see fist clause of the claim body). Therefore, no one reading claim 1 would construe the final clause of claim 1 as implying that the "bits" are derived from the content image blocks."

Contrary to the Examiner's position, claim 1 in fact recites that "wherein ones of the output halftone image blocks associated with respective ones of the bits having the first value are derived from respective ones of the contone image blocks," which states that the "halftone image blocks" are derived from the contone image blocks. This claim language is disclosed in the specification. For example, the contone image blocks are represented by x(m) (see, e.g., ¶ 30 and FIG. 3). A quantizer 340 generates quantized halftone image blocks o(m) from the contone image blocks (see ¶ 30 and FIG. 3). If the halftone bitmap bit has a value of 1 (i.e., b(m)=1), the bit is a data indicator bit and the corresponding block of the halftone image 390 is set to one of the code word symbols (see ¶ 31, ¶ 42, and FIG. 3). Therefore, ones of the output halftone image blocks associated with respective ones of the bits 310 having a value of 0 (or that correspond to image blocks meeting certain intensity thresholds) are derived from respective ones of the contone image blocks.

The Examiner also has misconstrued the last clause of claim 1 as reciting "ones of the bits having the second value are derived from respective ones of the graphical code word symbols." Contrary to the Examiner's position, claim 1 in fact recites that "ones of the output halftone image blocks associated with respective ones of the bits having the second value are derived from respective ones of the graphical code word symbols," which states that the "halftone image blocks" are derived from the graphical code word symbols. This claim language is disclosed in the specification. For example, the specification expressly discloses that ones of the output halftone image blocks associated with respective ones of the bits 310 having a value of 1 are derived from respective ones of the graphical code word symbols 360 (see ¶ 33, 42, and FIGS. 3-4).

Thus, the subject matter of claim 1 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. Therefore, the rejection of independent claim 1 under 35 U.S.C. § 112, first paragraph, should be withdrawn for at least this additional reason.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 7 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

<u>2.   Claims 2-11</u>

The Examiner has rejected claims 2-11 for the same reasons given in connection with the rejection of claim 1 (see § 4 on page 4 of the final Office action).

As explained above, the subject matter of claim 1 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. Therefore, the rejection of claims 2-11 under 35 U.S.C. § 112, first paragraph, should be withdrawn for at least the same reasons explained above in connection with claim 1.

Regarding claim 3, Appellant responded to the Examiner's assertion that "contone patch" was not disclosed in the specification by explaining that "contone patch" is disclosed in ¶ 13 and in each of claims 2, 22, and 30, as originally filed (see top of page 9 of the Appeal Brief).

With reference to ¶ 13, the Examiner has responded to this explanation as follows (see top of page 29 of the Answer):

> However, merely cites "The bitmap may be produced by half toning the constant patch of the graylevel" without functional structure elements, steps or processes disclosed in the disclosure to support the feature of "wherein the determining comprises producing the bitmap by half toning a contone patch of the graylevel value" <u>is not considered an adequate written description</u> of the claimed invention as claimed in the invention of claim 3. See, e.g. Univ. of Rochester v. GD. Searle & Co., 358 F.3d 916, 927, 69 USPQ2d 1886, 1894-95 (Fed. Cir. 2004).

Thus, the Examiner has acknowledged that ¶ 13 explicitly discloses that in some embodiments the bit map is produced by halftoning a constant patch of a graylevel. Yet, inexplicably, the Examiner insists that this disclosure is insufficient to provide written description support for claim 3, which recites that "the determining comprises producing the bitmap by halftoning a contone patch of the graylevel value." Without any explanation whatsoever why language in the specification that essentially tracks the same language recited in claim 3 "is not considered an adequate written description," the Examiner assertion amounts to no more than an impermissible conclusory statement that does not satisfy his burden under MPEP § 2163.II.A.3(b).

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 8 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

Therefore, the subject matter of claim 3 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. For at least these reasons, the rejection of independent claim 3 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

3.   Independent claim 21

On pages 9-10 of the Appeal Brief, Appellant explained that, contrary to the Examiner's assertion, the original specification clearly discloses first and second sequences of graphical code words. In response to this explanation, the Examiner dropped his original basis for rejecting the claim and now argues that the specification does not provide written description support for "ones of the output halftone image blocks associated with respective ones of the bits having the first value are derived from respective ones of the contone image blocks and ones of the output halftone image blocks associated with respective ones of the bits having the second value are derived from respective ones of the graphical code word symbols" (see pages 30-32 of the Answer). In particular, the Examiner has asserted that (pages 31-32 of the Answer):

> As discussed above, there is no functional structure elements, steps, or processes supporting the features of "respective ones of the bits having the first value are derived from respective ones of the contone image blocks" and "and ones of the bits having the second value are derived from respective ones of the graphical code word symbols" (emphasis are added by the examiner) as claimed in the invention of claim 21 in the original disclosure. See, e.g. Univ. of Rochester v. GD. Searle & Co., 358 F.3d 916, 927, 69 USPQ2d 1886, 1894-95 (Fed. Cir. 2004). At least for this rational, claim 21 rejection under 35 U.S.C. §112, first paragraph is maintained.

This new basis for rejecting claim 21 is the same as the Examiner's basis for rejecting independent claim 1. Once again, the Examiner's proposed construction of the claim language is unreasonable because it is inconsistent with the way in which anyone would read the claim. For example, in accordance with the Examiner's construction, the subject of the claim (i.e., "ones of the output halftone image blocks") is left dangling without any verb, effectively rendering the clause incomplete and without meaning. In addition, claim 1 expressly states that the "bits" are

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899 .
Filed : Oct. 31, 2003
Page : 9 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

elements of a bi-level bitmap that is determined from a graylevel value (see fist clause of the claim body). Therefore, no one reading claim 21 would construe the "producing" element of claim 21 as implying that the "bits" are derived from the content image blocks."

The subject matter of claim 21 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed for the same reasons explained above in connection with independent claim 1. For at least these reasons, the rejection of independent claim 21 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

Claim 21 has not been rejected for any basis other than under 35 U.S.C. § 112, first paragraph. Therefore, claim 21 should be allowed.

4. Claims 22-28

The Examiner has rejected claims 22-28 for the same reasons given in connection with the rejection of claim 21 (see § 4 on page 4 of the final Office action).

As explained above, the subject matter of claim 21 is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. Therefore, the rejection of claims 22-28 under 35 U.S.C. § 112, first paragraph, should be withdrawn for at least the same reasons explained above in connection with claim 21.

Claims 22-27 have not been rejected for any reason other than under 35 U.S.C. § 112, first paragraph.

B.   Claims 1-11, 18, 28, and 38 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-11, 18, 28, and 38 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 10 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

1.   Claims 1-11

The sole basis given in support of the rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph, is the assertion that "Applicant failed to particularly point out how and in what extent the derivation of values from 'contone image block' and 'graphical code word' discussed in the claim rejection under 35 U.S.C. 112 first paragraph" (see § 6 on page 4 of the final Office action).

On page 12 of the Appeal Brief, Appellant explained that the Examiner's unsubstantiated assertion does not constitute an explanation why one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification and the prior art, would not have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claims 1-11 and, therefore, the Examiner has not established a *prima facie* case of indefiniteness and therefore the rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph.

The Examiner responded to this explanation by asserting that "Without the description support in the disclosure, one ordinary skill in the art does not know what how and what extent that the features of 'respective ones of the bits having the first value are derived from respective ones of the contone image blocks' and 'and ones of the bits having the second value are derived from respective ones of the graphical code word symbols' are carried through" (see page 33, bottom ¶ of the Answer). This response, however, improperly conflated his rejection of claims 1-11 under 35 U.S.C. § 112, first paragraph, with a rejection under 35 U.S.C. § 112, second paragraph. In order to support his rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph , the Examiner is obligated to establish that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would not have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claims (see *Ex parte* Wu, 10 USPQ 2d 2031, 2033 (B.P.A.I. 1989) and MPEP § 2173.02). The Examiner's unsubstantiated assertion (which is rebutted above) that the specification does not satisfy the written description requirement under 35 U.S.C. § 112, first paragraph, does not meet the requirements needed to establish indefiniteness under 35 U.S.C. § 112, second paragraph. For at least this reason, the rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 11 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

Moreover, the entire basis for the Examiner's rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph, rests on his improper construction of the last clause of independent claim 1 (see page 33, bottom paragraph, of the Answer). As explained above in connection with the rejection of independent claim 1 under 35 U.S.C. § 112, second paragraph, the Examiner's construction is unreasonable because it is inconsistent with the way in which anyone would read the claim. For example, in accordance with the Examiner's construction, the subject of the claim (i.e., "ones of the output halftone image blocks") is left dangling without any verb, effectively rendering the clause incomplete and without meaning. In addition, claim 1 expressly states that the "bits" are elements of a bi-level bitmap that is determined from a graylevel value (see fist clause of the claim body). Therefore, no one reading claim 21 would construe the "producing" element of claim 21 as implying that the "bits" are derived from the content image blocks."

For at least these reasons, the rejection of claims 1-11 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

2. Claims 18, 28, and 38

On page 13 of the Appeal Brief, Appellant explained that, contrary to the Examiner's assertion, claims 18, 28, and 38 are definite. In particular, the adjective "likely" means "having a high probability of occurring or being true : very probably" (see Merriam-Webster's Collegiate Dictionary - Tenth Edition (1995)). One of ordinary skill in the pertinent art, when reading claims 18, 28, and 38 in light of the supporting specification (see, e.g., ¶ 43) would have been able to ascertain with a reasonable degree of precision and particularity the particular area set out and circumscribed by the claims. In particular, such a person would have been able to ascertain that a likely sequence of graphical code word symbols is a graphical code word symbol sequence that has a high probability of being the actual code word sequence that was encoded into the halftone image.

The Examiner responded to this explanation by asserting that "using words like 'likely' in the claim is considered indefinite" (see bottom ¶ on page 34 of the Appeal Brief). The Examiner, however, has not met his obligation to establish that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would not have been able to ascertain with a reasonable degree of precision and particularity the particular area

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 12 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

set out and circumscribed by the claims (see *Ex parte* Wu, 10 USPQ 2d 2031, 2033 (B.P.A.I. 1989) and MPEP § 2173.02). The Examiner has not even attempted to rebut Appellant's explanation that one of ordinary skill in the pertinent art, when reading claims 18, 28, and 38 in light of the supporting specification (see, e.g., ¶ 43) would have been able to ascertain that a likely sequence of graphical code word symbols is a graphical code word symbol sequence that has a high probability of being the actual code word sequence that was encoded into the halftone image.

For at least these reasons, the rejection of claims 18, 28, and 38 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

C.   **Claims 1-7, 10, 11, and 29-34 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420) and Wang (U.S. 5,337,361).**

Claims 1-7, 10, 11, and 29-34 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420) and Wang (U.S. 5,337,361).

1.   Claim 1

On pages 15-21 of the Appeal Brief, Appellant explained that the rejection of independent claim 1 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be withdrawn because Curry, Tai, and Wang, taken either alone or in any permissible combination, do not disclose or suggest all the elements of the claimed invention. The rejection of claim 1 also should be withdrawn because at the time the invention was made there was not any apparent reason to combine the teachings of Curry, Tai, and Wang in the manner proposed by the Examiner.

On pages 16-18 of the Appeal Brief, Appellant explained that Curry in view of Tai and Wang doe not disclose or suggest the "producing" element of claim 1.

Regarding the first clause of the "producing" element (i.e., "producing blocks of an output halftone image from ones of the contone image blocks and ones of the graphical code word symbols in accordance with the values of respective ones of the bits of the bi-level

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 13 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

bitmap"), Appellant explained that the cited disclosure of Curry shows a method of producing an output halftone image in which the output halftone image is formed exclusively formed from halftone cells that encode information in their respective rotational orientations and, therefore, Curry fails to show that the output halftone image is formed from ones of the grayscale image data output by the image generator 12 (see top of page 17 of the Appeal Brief).

The Examiner has responded to this explanation by asserting that:

> ... Curry discloses producing blocks (e.g. halftone cells 20,22 & 24 of Fig. 3) of an output halftone image (Fig. 3) from ones of the contone image blocks (grayscale sample values, or cells or blocks, col 3, line 37 to col 4, line 5).

Contrary to the Examiner's assertion, Curry expressly discloses that all of the halftone cells from which the output halftone image is generated are composed of cells that encode information (i.e., graphical code word symbols) (see, e.g., col. 4, lines 1-32).

Thus, the Examiner has failed to rebut Appellant's explanation that Curry in view of Tai and Wang fail to disclose or suggest the "producing" element of claim 1. For at least this reason, the rejection of claim 1 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be withdrawn.

Regarding the second clause of the "producing" element (i.e., "wherein ones of the output halftone image blocks associated with respective ones of the bits having the first value are derived from respective ones of the contone image blocks and ones of the output halftone image blocks associated with respective ones of the bits having the second value are derived from respective ones of the graphical code word symbols"), Appellant explained that the cited disclosure of Curry teaches a method of producing an output halftone image in which the output halftone image is formed exclusively from halftone cells that encode information in their respective rotational orientations. For example, FIG. 3 clearly shows that the regions of the output halftone image that contain the human-readable pattern and the regions of the output halftone image that do not contain the human-readable pattern all are formed by halftone cells encoded with both ones and zeros.

The Examiner has responded to this explanation by asserting that:

...Curry discloses ones of the graphical code word symbols (e.g.
the letter "R" of Fig. 3) in accordance with the values of respective
ones of the bits of the bi-level bitmap (e.g. bitmap codes are
generated based on a desired pattern or "the graphical code word
symbols" to be embedded within the halftone image, and the
desired pattern is input into bitmap generator 10 of Fig. 1, col 3,
lines 36-45, and to encode the data either by the presence or "1",or
absence or "0" of marks at a sequence of spatial locations, col 1,
lines 46-50 discussed above).

The Examiner's response rests on a misunderstanding of Curry's disclosure. In col. 1,
lines 46-50, Curry describes background art in which a pattern encodes data with the presence or
absence of marks. This disclosure does not even remotely suggest that Curry's system operates
by placing halftone cells in some areas of the output halftone image and not others; instead, the
entire output halftone image consists of the same type of halftone cells. In particular, the "1" and
"0" shown in FIG. 3 do not indicate the presence and absence of marks. Instead, Curry expressly
discloses that the "The '1' or '0' are shown for illustration purposes only in FIG. 3 and represent
a data value that may be encoded in each of the halftone cells 20" (col. 4, lines 59-62 of Curry).
That is, the output halftone image is formed exclusively formed from halftone cells that encode
information in their respective rotational orientations; all of the halftone cells in the output
halftone image are made up of the halftone cells, which the Examiner has asserted correspond to
the "graphical code word symbols" recited in claim 1.

Thus, the Examiner has failed to rebut Appellant's explanation that Curry in view of Tai
and Wang fail to disclose or suggest the "producing" element of claim 1. For at least this reason,
the rejection of claim 1 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be
withdrawn.

On pages 18-19 of the Appeal Brief, Appellant explained that Curry in view of Tai and
Wang doe not disclose or suggest the "determining" element of claim 1. In particular, Appellant
explained that, contrary to the Examiner's assertion, Tai does not disclose or suggest
"determining a bi-level bitmap of bits from a graylevel value, wherein each of the bits has a
respective one of either a first value or a second value," as recited in claim 1.

In response to this explanation, the Examiner has changed his original rationale in
support of the rejection of claim 1 under 35 U.S.C. § 103(a) under Curry in view of Tai and

Applicant : Niranjan Damera-Venkata   Attorney's Docket No.: 200207907-1
Serial No. : 10/698,899   Reply Brief dated Mar. 6, 2009
Filed   : Oct. 31, 2003   Reply to Answer dated Jan. 8, 2009
Page   : 15 of 25

Wang. In particular, the Examiner originally took the position that Curry does not disclose the "determining" element of claim 1 (see page 6 of the Office action dated April 9, 2008), but Tai made-up for this failure. Now the Examiner has dropped his assertion that Tai discloses the "determining" element of claim 1 and instead relies upon Curry to support his contention that the cited references disclose the "determining" element of claim 1. In particular, the Examiner has asserted that Curry discloses "determining a bi-level bitmap of bits from a graylevel value, wherein each of the bits has a respective one of either a first value or a second value" as follows (see page 38, bottom ¶ of the Answer):

> For instance, Curry' 636 discloses determining a bi-level bitmap of bits from a graylevel value (e.g. Curry discloses that halftone image, such as the one disclosed in Figs. 3 and 4, is generated based on grayscale image data and bitmap codes, by the halftone generator as disclosed in Fig. 1, col 3, lines 37-61; and grayscale image data e.g., a 8-bits at 0-255 different intensity and a halftone image is a binary image are well known in the art; bitmap codes are generated based on a desired pattern to be embedded within the halftone image, and the desired pattern is input into bitmap generator 10 of Fig. 1, col 3, lines 36-45; the purpose of having bitmap code generated from pattern in the processing of encoding is to encode the data either by the presence or absence of marks at a sequence of spatial locations, col 1, lines 46-50; thus, <u>bitmap code is a bi-level bitmap of bits and is determined from a graylevel value for either is "presence" or "absence" of marks in order to match the grayscale input images</u>).

Contrary to the Examiner's assertion, however, the bitmap codes that are generated by the bitmap generator 10 are not a bi-level bitmap of bits that is determined from a graylevel value, as recited in claim 1. Instead, Curry expressly discloses that (col. 3, lines 41-45):

> The bitmap codes are generated by a bitmap generator 10 based upon a desired pattern to be embedded within the halftone image. The desired pattern may be input to bitmap generator 10 on, for example, a keyboard (not shown) connected to the bitmap 45 generator 10.

The output of a keyboard is not a bi-level bitmap of bits that is determined from a graylevel value. Moreover, including "determining a bi-level bitmap of bits from a graylevel

Applicant : Niranjan Damera-Venkata.
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 16 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

value" in Curry would not have served any apparent useful purpose in the context of Curry's system. In particular, Curry's system produces a halftone image from a set of halftone cells (shown in FIGS. 2A-2C), where the orientation of the halftone cells is controlled by the bit map codes (corresponding to the input pattern) output from the bitmap generator 10 and the tone of the halftone cells is controlled by the grayscale image data output from the image generator 12. It would not have served any apparent useful purpose to determine the bit map codes "from a graylevel value" because the resulting bit map codes would no longer be "based upon a desired pattern to be encoded within the halftone image," in accordance with Curry's teachings (see col. 3, lines 42-43).

Thus, the cited references, taken either alone or in any permissible combination, do not disclose the "determining" element of claim 1. For at least this additional reason, the rejection of independent claim 1 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be withdrawn.

On pages 19-21 of the Appeal Brief, Appellant explained that one skilled in the art would not have had any apparent reason to combine the teachings of the cited references in the manner proposed by the Examiner. The Examiner has responded to this explanation as follows (see pages 39-40 of the Answer; emphasis added):

> In re, the examiner disagrees with the assertion made above by the appellant. Giving the fact that the method of processing a contone image of claim 1 can be processed in the image generation system of Curry' 636, and the fact that the teaching of partitioning (c.g. creating) the contone image into an array of contone image blocks in more detail by Tail' 420, one ordinary skill in the art at the time the invention was made could be motivated to modify the image generation system of Curry' 636 to include the technique of partitioning the grayscale image data disclosed in Curry to improve the image quality by eliminating jagged edges. Further, In the same field of endeavor, Wang' 361 discloses generating (e.g. composing) a sequence of graphical code word symbols encoding information (Wang' 361 discloses "a sequence of graphical code word symbols encoding information" such codeword structure of PDF417, Figs. 1 & 2, col, 5, line 56 to col 7, line 60, and encoding/decoding process in col 7, line 63 to col 8, line 58, and so on); and
>
> Giving the fact that the method of processing a contone image of claim 1 can be processed in the image generation system of Curry'

636, and the fact that the teaching of partitioning (e.g. creating) the
contone image into an array of contone image blocks in more
detail by Tai' 420, one ordinary skill in the art at the time the
invention was made could be motivated to modify the combination
of Curry' 636 and Tai' 420 to include <u>generating a sequence of
graphical code word symbols encoding information since doing so
would not only to increase the versatility of Curry's method, but
also to improve the finished image validation or authentication</u>.

The Examiner's response, however, does not rebut Appellant's explanation that the

disclosure in col. 13, lines 29-34 of Tai does not support the Examiner's assertion that

partitioning the grayscale image data disclosed in Curry into an array of contone image blocks

produces smoother image without jagged edges. Instead, the cited disclosure teaches that

replacing the binary input data from a threshold/detector with enhanced grayscale output

produces a smoother image without jagged edges. One skilled in the art would not have had any

apparent reason to make the Examiner's proposed modification of Curry because the grayscale

image data disclosed in Curry does not constitute "binary data". In addition, is it unclear what

the result of the Examiner's proposed modification of Curry's system would be since the output

halftone image is produced solely of the preprogrammed halftone cells (see FIGS. 2A-2C) whose

tone is controlled by the grayscale image data.

The Examiner's response also does not rebut Appellant's explanation that Wang does not

support the Examiner's assertion that modifying Curry's system to include generating a sequence

of graphical code word symbols encoding information would validate or authenticate the finished

image. Instead, Wang discloses that "It is therefore an object of this invention to provide a

record with a graphic image along with encoded information to validate or authenticate the

record" (col. 2, lines 13-15). This disclosure would not have given anyone any apparent reason

to modify Curry's system as proposed by the Examiner because it does not describe anything

about a sequence of graphical code word symbols (a "graphic image" does not connote a

sequence of graphical code word symbols).

The Examiner's response additionally does not rebut Appellant's explanation that the

Examiner's rationale given in support of his proposed modification of Curry amounts to no more

than circular reasoning. In particular, the Examiner's proffered motivation (i.e., because it would

produce smoother image without jagged edges or allow validation or authentication of the

finished image) assumes the result (i.e., the modification of Curry's system) to which the proffered "motivation" was supposed to have led one skilled in the art. Such circular reasoning cannot possibly support a rejection under 35 U.S.C. § 103(a). Indeed, such circular reasoning only evidences the fact that the Examiner improperly has engaged in impermissible hindsight reconstruction of the claimed invention, using applicants' disclosure as a blueprint for piecing together elements from the prior art in a manner that attempts to reconstruct the invention recited in claim 1 only with the benefit of impermissible hindsight (see <u>KSR Int'l Co. v. Teleflex Inc.,</u> slip op. at 17: "A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning."). The fact is that none of the cited references nor the knowledge generally available at the time the invention was made would have led one skilled in the art to believe that there was any problem to be solved or any advantage that would be gained by the Examiner's proposed modification of Curry's system.

Without any apparent reason for modifying Curry's system, the Examiner's rationale in support of the rejection of claim 1 amounts to no more than a conclusory statement, which cannot establish that one skilled in the art would have had any apparent reason to combine Curry, Tai, and Wang in the manner proposed by the Examiner. See In re Kahn, 441 F. 3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness").

For at least these additional reasons, the rejection of claim 1 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be withdrawn.

2.   Claims 2-7, 10 and 11

Each of claims 2-7, 10, and 11 incorporates the elements of independent claim 1 and therefore is patentable over Curry in view of Tai and Wang for at least the same reasons explained above.

On pages 21-22 of the Appeal Brief, Appellant explained additional reasons why claim 7 is patentable over Curry in view of Tai and Wang . In particular, Appellant explained that the rationale given by the Examiner in support of the rejection of claim 1 does not include any showing whatsoever that any of the cited references discloses or suggests and "determining

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 19 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

whether to derive ones of the output halftone image blocks from either respective ones of the contone image blocks or respective ones of the graphical code word symbols based on image intensity levels in the respective ones of the contone image blocks."

The Examiner has responded to this explanation by asserting that Curry discloses this element in various asserted places (see page 42, line 1 through page 43, line 3). Contrary to the Examiner's voluminous set of assertions, Curry does not disclose "determining whether to derive ones of the output halftone image blocks from either respective ones of the contone image blocks or respective ones of the graphical code word symbols based on image intensity levels in the respective ones of the contone image blocks." Instead, Curry expressly discloses that the output halftone image is formed exclusively from halftone cells that encode information in their respective rotational orientations. For example, FIG. 3 clearly shows that the regions of the output halftone image that contain the human-readable pattern and the regions of the output halftone image that do not contain the human-readable pattern all are formed by halftone cells encoded with both ones and zeros. Thus, Curry does not make any determination of whether to derive ones of the output halftone image blocks from either respective ones of the contone image blocks or respective ones of the graphical code word symbols. Furthermore, the intensity levels of the grayscale image data are used only to control the tone of the halftone cells (see, e.g., col. 4, lines 23-33; and col. 5, lines 8-15).

For at least this additional reason, the rejection of claim 7 under 35 U.S.C. § 103(a) over Curry in view of Tai and Wang should be withdrawn.

3.   Claims 29-34

Independent claim 29 recites elements that essentially track the pertinent elements of independent claim 1 discussed above. Therefore, claim 29 is patentable over Curry in view of Tai and Wang for at least the same reasons explained above in connection with independent claim 1:

Each of claims 30-34 incorporates the elements of independent claim 29 and therefore is patentable over Curry in view of Tai and Wang for at least the same reasons.

Claim 34 also is patentable over Curry in view of Tai and Wang for the same additional reasons explained above in connection with claim 7.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 20 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

D.   Claims 8 and 9 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420), Wang (U.S. 5,337,361), and Lapstun (U.S. 6,512,596).

Claims 8 and 9 stand rejection under 35 U.S.C. § 103(a) over Curry (U.S. 5,710,636) in view of Tai (U.S. 7,218,420), Wang (U.S. 5,337,361), and Lapstun (U.S. 6,512,596).

Each of claims 8 and 9 incorporates the elements of independent claim 1. Lapstun does not make-up for the failure of Curry, Tai, and Wang to disclose or suggest the elements of independent claim 1 discussed above. The Examiner has not even attempted to rebut this conclusion. Therefore, claims 8 and 9 are patentable over Curry in view of Tai, Wang, and Lapstun for at least the same reasons explained above.

On pages 23-24, Appellant explained that claims 8 and 9 also are patentable over Curry in view of Tai, Wang, and Lapstun for the following additional reasons.

Regarding claim 8 and 9, Appellant explained that the cited disclosure of Lapstun does not disclose or suggest anything whatsoever about error diffusion halftoning grayscale data that is fed into a halftone generator of the type disclosed in Curry, which halftone generator selects preprogrammed halftone cells from a lookup table based on the values of the grayscale data and bitmap codes. Therefore, one skilled in the art would not have had any apparent reason to combine the teachings of Curry and Lapstun in the manner proposed by the Examiner. To the contrary, one skilled in the art would have not been motivated to combine the reference teachings in this way because the error diffusion halftoning would not have served any apparent useful purpose because the output of Curry's halftone generator would not be affected; in particular, the output would still be a series of preprogrammed halftone cells (see col. 4, lines 1-5).

The Examiner has responded to this explanation as follows (see pages 44-45 of the Answer; emphasis added):

> In re, the examiner disagrees the above statements. Giving the fact that a halftone image is a binary image and error diffusion is a type of half toning. Having the fact that halftone cells 20, 22 and 24 are produced from dot patterns forming different shapes (col 4, lines 6-21, Curry' 636) and is fed to . One ordinary skill in the art would have been motivated to modify Curry' 636 reference for both claims 8 and 9 to include error diffusion for producing halftone cells or blocks since doing so would improve half toning quality by

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 21 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

> distributing errors or the differences of attributes into each image
> cell or block.

In this response, the Examiner has taken the position that one skilled in the art would have been motivated to perform error diffusion halftoning on the halftone cells. Such a modification of Curry's system, however, would not meet the language of claim 8. In particular, claim 8 recites "error diffusion halftoning the contone image blocks"; the halftone cells, on the other hand, are not blocks partitioned from an input image nor are they contone image blocks; instead, they are binary image blocks. Furthermore, contrary to the Examiner's assumption, there are no errors to diffuse in the halftone cells; therefore, no one would have had any apparent reason to perform error diffusion halftoning on the halftone cells.

The Examiner has not even attempted to rebut Appellant's explanation that one skilled in the art would have not been motivated to combine the reference teachings in this way because the error diffusion halftoning would not have served any apparent useful purpose because the output of Curry's halftone generator would not be affected; in particular, the output would still be a series of preprogrammed halftone cells (see col. 4, lines 1-5). Nor has the Examiner even attempted to rebut Appellant explanation that, in the context of Curry's halftone generator, there are no error values to diffuse.

For at least this additional reason, the rejection of claims 8 and 9 over Curry in view of Tai, Wang, and Lapstun should be withdrawn.

E. Claims 12-20 and 35-38 stand rejection under 35 U.S.C. § 103(a) over Wang (U.S. 6,252,971) in view of Curry (U.S. 5,710,636) and Wang (U.S. 5,337,361).

Claims 12-20 and 35-38 stand rejection under 35 U.S.C. § 103(a) over Wang (U.S. 6,252,971; hereinafter Wang '971) in view of Curry (U.S. 5,710,636) and Wang (U.S. 5,337,361; hereinafter Wang '361).

On pages 26-29 of the Appeal Brief, Appellant explained that, contrary to the Examiner's position, Wang '971 does not disclose or suggest any of the "partitioning", "identifying", and "extracting" elements of claim 12.

On page 48 of his Answer, the Examiner has asserted that Wang '971 discloses the "partitioning" element as follows:

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 22 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

> ...partitioning the halftone image into a plurality of image blocks
> (refer to Fig. 6, halftone image is partitioned into a series of tiles,
> or blocks, e.g. "these tiles establish the basic building blocks from
> which zero phase-shifted clustered halftones can be converted to π
> phase-shifted cluster halftones" also indicating that halftone image
> is partitioned into tiles or blocks; col 4, lines 1-28);...

Contrary to the Examiner's assertion, however, Wang '971 does not disclose that the input image containing embedded information partitioned into a plurality of image blocks. Instead, the input image analyzed to determine the average amplitude and the angle of halftone frequency of the input image a checkerboard reference pattern having the same halftone frequency and size of the input image is generated, and the reference pattern is overlapped with the input image (see col. 7, lines 25-39 and 56-65, and FIGS. 12 and 13). In addition, contrary to the Examiner's position, col. 4, lines 1-28 of Wang '971 does not disclose the "partitioning" element of claim 12; instead, this disclosure describes how a watermark is embedded in an input image, not how information is extracted from an input image.

On page 48 of his Answer, the Examiner has asserted that Wang '971 discloses the "identifying" element as follows:

> ... identifying (e.g. detecting) a code word sequence (e.g. the
> watermark of "T" in the image blocks) in the selected blocks (e.g.
> by arranging tiles in a particular order as disclosed in Fig. 7, col 4,
> lines 29-44);...

Contrary to the Examiner's assertion, however, Wang '971 does not disclose "identifying a code word sequence in the selected blocks," where the blocks are selected using a bi-level bitmap (see the "using" element of claim 12). As explained in the preceding paragraph, in the information extraction method disclosed in Wang '971 the input image containing embedded information is not partitioned into a plurality of image blocks. Since there are no blocks, Wang '971 cannot possibly disclose "identifying a code word sequence in the selected blocks." Instead, Wang '971 discloses that the input image analyzed to determine the average amplitude and the angle of halftone frequency of the input image a checkerboard reference pattern having the same halftone frequency and size of the input image is generated, and the reference pattern is overlapped with the input image (see col. 7, lines 25-39 and 56-65, and FIGS. 12 and 13).

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 23 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

Inexplicably, the Examiner has not even bothered to attempt to rebut Appellant's explanation that Wang '971 does not disclose the "identifying" element of claim 12 in any of col. 4, lines 29-44 (cited by the Examiner) and col. 7, lines 1-24 (see second ¶ on page 27 of the Appeal Brief; and pages 45-48 of the Answer).

On page 48 of his Answer, the Examiner has asserted that Wang '971 discloses the "extracting" element as follows:

> ... extracting the information from the code word sequence (refer to Fig. 11, a watermark extracting device 700' for extracting embedded digital watermark, col 7, lines 1-24).

Contrary to the Examiner's assertion, however, Wang '971does not disclose "extracting the information from the code word sequence," where the code word sequence is identified in the selected blocks (see the "using" and "identifying" elements of claim 12). As explained in the preceding paragraph, in the information extraction method disclosed in Wang '971 a code word sequence is not identified in the selected blocks. Since there are no blocks, Wang '971 cannot possibly disclose "identifying a code word sequence in the selected blocks." Instead, Wang '971 discloses that the input image analyzed to determine the average amplitude and the angle of halftone frequency of the input image a checkerboard reference pattern having the same halftone frequency and size of the input image is generated, and the reference pattern is overlapped with the input image (see col. 7, lines 25-39 and 56-65, and FIGS. 12 and 13).

Inexplicably, the Examiner has not even bothered to attempt to rebut Appellant's explanation that Wang '971 does not disclose the "identifying" element of claim 12 in of col. 7, lines 1-24 (see first ¶ on page 28 of the Appeal Brief; and pages 45-48 of the Answer).

For the reasons explained above and in the Appeal Brief, Wang '971 does not disclose or suggest any of the "partitioning", "identifying", and "extracting" elements of claim 12.

On pages 28-29 of the Appeal Brief, Appellant explained that, contrary to the Examiner's position, Curry does not disclose or suggest disclose the "using" element in claim 12 in col. 2, lines 35-40 and col. 4, lines 1-5.

On page 48 of his Answer, the Examiner has asserted that Curry discloses the "using" element as follows:

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 24 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

> Curry discloses the limitation of using the bitmap to select at least
> some of the blocks ("The bitmap codes are based upon at least one
> human readable pattern to be formed within the image", col 2, lines
> 35-40, and "the human readable pattern 29 shown in Fig. 3 is a
> letter 'R'"; one skilled in the art at the time the invention was made
> knows to use bitmap to select some of cells, or blocks, e.g. cells
> 20, 22 and 24, because bitmap codes are generated from those
> cells, or blocks, col 4, lines 45-56).

Contrary to the Examiner's assertion, however, the bitmap codes that are used to control the rotation of the halftone cells in Curry's system do not constitute the bi-level bit map that is determined from a graylevel value as recited in claim 12 (via claim 1). Instead, the bitmap codes are generated by the bitmap generator based on input received from a keyboard connected to the bitmap generator (see col. 3, lines 42-45 of Curry). Moreover, the cited disclosure describes a process of encoding information into a halftone image, not extracting information embedded in a halftone image. In col. 4, lines 1-5, Curry discloses that the halftone generator 10 retrieves from a table halftone cells that are addressed by the grayscale image sample values output by the image generator 12 and the bitmap codes output by the bitmap generator 10. This disclosure also describes a process of encoding information into a halftone image, not extracting information embedded in a halftone image.

Inexplicably, the Examiner has not even bothered to attempt to rebut Appellant's explanation that the only disclosure in Curry regarding the way in which information is extracted from the output halftone image implies that the output halftone images are read by determining the rotational orientations of the halftone cells that make up the output halftone image (see col. 4, lines 63-66). Such a process would not involve using a bi-level bitmap to select at least some of the blocks partitioned from a halftone image containing embedded information. Indeed, as explained above in connection with independent claim 1, each of the output halftone image blocks is encoded with either a "1" or a "0" in order to produce the human-readable patter (see col. 4, lines 57-59; also see FIG. 3). In this case, using the bitmap to select at least some of the blocks would not serve any apparent useful purpose.

For at least these additional reasons, the rejection of claim 12 under 35 U.S.C. § 103(a) over Wang '971 in view of Curry and Wang '361 should be withdrawn.

Applicant : Niranjan Damera-Venkata
Serial No. : 10/698,899
Filed : Oct. 31, 2003
Page : 25 of 25

Attorney's Docket No.: 200207907-1
Reply Brief dated Mar. 6, 2009
Reply to Answer dated Jan. 8, 2009

2.   Claims 13-20

Each of claims 13-20 incorporates the elements of independent claim 12 and therefore is patentable over Wang '971 in view of Curry and Wang '361 for at least the same reasons explained above.

3.   Claims 35-38

Independent claim 35 recites elements that essentially track the pertinent elements of independent claim 12 discussed above. ·Therefore, claim 35 is patentable over Wang '971 in view of Curry and Wang '361 for at least the same reasons explained above in connection with independent claim 12.

Each of claims 36-38 incorporates the elements of independent claim 35 and therefore is patentable over Wang '971 in view of Curry and Wang '361 for at least the same reasons.

IV.   Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

Date: March 6, 2009

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